

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

CLAIMS

1. (currently amended) A chemical mechanical planarization (CMP) system, comprising:

a wafer carrier configured to support a wafer during a planarization process, the wafer carrier including a sensor configured to detect a signal indicating a stress being experienced by the wafer during planarization;

a computing device in communication with the sensor, the computing device configured to translate the signal to generate a stress map for analysis; and

a stress relief device responsive to a signal received from the computing device, the stress relief device configured to relieve the stress being experienced by the wafer, the stress relief device including a fluid supply configured to apply a fluid to a top surface of a slurry substantially uniformly disposed over a polishing pad of the CMP system.

2. (original) The system of claim 1, includes one of a proximity sensor and a temperature sensor, the proximity sensor configured to detect a signal indicating a mechanical stress, the temperature sensor configured to detect a signal indicating a thermal stress.

3. (original) The system of claim 2, wherein the proximity sensor is an eddy current sensor and the temperature sensor is an infrared sensor.

4. (currently amended) The system of claim 1, further comprising:
a fluid curtain control configured to apply a fluid curtain to substantially
smooth the slurry disposed over the polishing pad, the fluid curtain being applied
upstream from where the fluid is applied to the top surface of the slurry wherein the
~~stress relief device is selected from the group consisting of a fluid supply, a platen,~~
~~and a speed controller.~~

5. (original) The system of claim 1, wherein the stress relief device is capable of differentially applying a corrective action to relieve the stress.

6. (currently amended) A chemical mechanical planarization (CMP) system capable of monitoring thermal stress associated with a substrate being processed, comprising:

a wafer carrier having a plurality of sensors, each of the plurality of sensors configured to detect a signal corresponding to a temperature of a region of the substrate;

a computing device in communication with the plurality of sensors, the computing device configured to generate a thermal map of the substrate from the signal, the computing device capable of analyzing data associated with the thermal map to identify any region of the substrate experiencing thermal stress; and

a stress relief device responsive to the computing device, wherein the stress relief device is triggered to relieve the thermal stress when the computing device identifies any region of the substrate experiencing thermal stress, the stress relief device including a fluid supply system capable of delivering a fluid to a top portion of a smoothed layer of slurry deposited over a polishing pad, the portion of the smoothed layer associated with one of the any region of the substrate experiencing thermal stress.

7. (original) The system of claim 6, wherein the computing device includes a signal compensation module configured to account for a signal delay associated with the signal corresponding to the temperature.

8. (original) The system of claim 6, wherein the wafer carrier rotatably supports the substrate over a polishing pad, the polishing pad capable of moving in a linear direction while the wafer rotates.

9. (currently amended) The system of claim 6, wherein the fluid supply system includes a nozzle for delivering the fluid, the nozzle located downstream from a barrier smoothing the slurry deposited over the polishing pad ~~stress relief device includes a fluid supply system capable of delivering a fluid to a portion of a smoothed layer of slurry deposited over a polishing pad, the portion of the smoothed layer associated with one of the any region of the substrate experiencing thermal stress.~~

10. (currently amended) A chemical mechanical planarization (CMP) system capable of monitoring mechanical stress associated with a substrate being processed, comprising:

a wafer carrier having a sensor embedded therein, the sensor configured to detect a signal indicative of a mechanical load experienced by a corresponding location on the substrate during processing;

a computing device in communication with the sensor, the computing device configured to generate a mechanical stress map of the substrate from the signal, the computing device capable of analyzing data associated with the mechanical stress map to identify a region of the substrate experiencing mechanical stress; and

a stress relief device responsive to the computing device, wherein the stress relief device is triggered to relieve the mechanical stress when the computing device identifies any region of the substrate experiencing mechanical stress.

11. (original) The system of claim 10, wherein the wafer carrier rotatably supports the substrate over a polishing pad, the polishing pad capable of moving in a linear direction while the wafer rotates.

12. (original) The system of claim 10, wherein the stress relief device includes a drive motor, the drive motor capable of reducing one of a rotational speed of the wafer carrier and a linear velocity of a polishing pad to relieve the mechanical stress.

13. (original) The system of claim 10, wherein the computing device is a general purpose computer and the stress relief device is one of a drive motor and a platen.

Claims 14-24 (Cancelled)